Claim 6

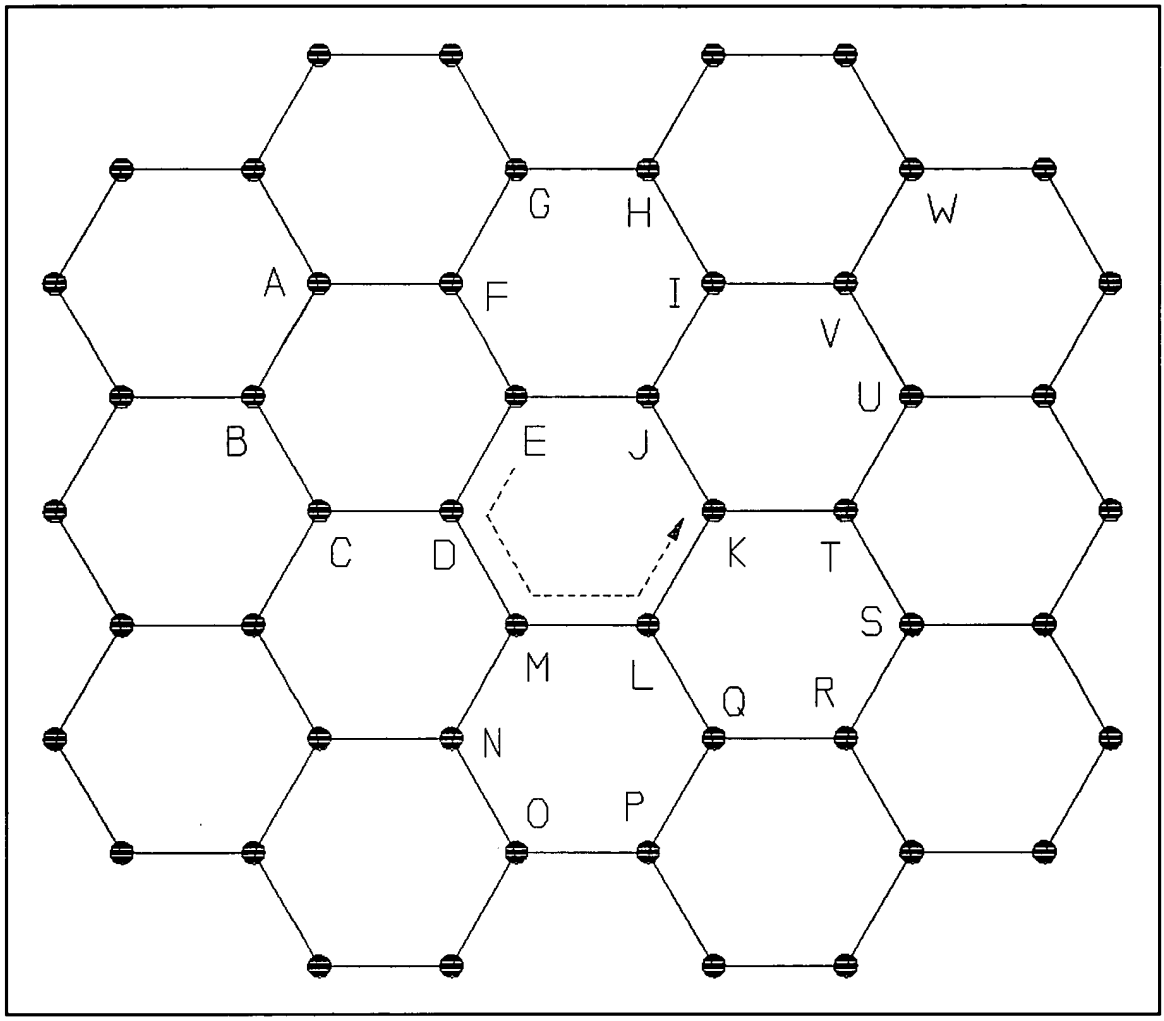
Claim 6 was rejected on grounds of anticipation, based on Perlman. Claim 6 recites (1) generating a particular type of message, (2) transmitting the message to "neighbors" and (3)

> b) at **each** neighbor,
>
> . . .
>
> ii) transmitting the message to neighbors of the neighbor.

That operation has not been shown in Perlman. Perlman discusses transmission of messages from one node to every other node in his network. It may be thought that this type of transmission would necessarily include the neighbors.

That may be so, but claim 6 does not recite merely that. Claim 6 states that "**EACH** neighbor" transmits the message to its own neighbors. That implies at least two differences over Perlman.

One difference is simple: redundancy exists. Sketch 1 below illustrates a network.



Sketch 1

Node K has neighbors J and L. Under claim 6, node K will receive redundant messages, from both J and L. That has not been shown in Perlman, who presumably addresses a **single** individual message to each recipient.

(The redundancy does not cause problems in the invention,

because the messages are eventually extinguished by mechanisms described in the Specification.)

The second difference is more complex. The messages in Perlman are routed from node-to-node, beginning with the origin-node and ending with the destination-node. Assume, in Sketch 1 above, that node E originates the message of claim 6. If that message is sent to all other nodes, as in Perlman, it could be done in any of the following ways, and others:

1. One message is sent to F who keeps it, one to D who keeps it, and all others to J, who keeps his message, and relays the rest to the other nodes.

2. One message to F who keeps it, one to J who keeps it, and all others to D, who keeps his message, and relays the rest to the other nodes.

3. One message to D who keeps it, one to J who keeps it, and all others to F, who keeps his message, and relays the rest to the other nodes.

However, none of these three approaches shows claim 6. For example, in (1) and (2), F does not relay messages to its neighbors.

Therefore, Perlman does not state the exact way in which he

routes his messages. Three ways have just been shown, none of which show claim 6. Additional ways, not described above, are also possible.

The PTO has not shown the particular operation of claim 6(b) in Perlman. As just explained, Perlman does not need to take the approach of claim 6(b) to accomplish his objective.

Added dependant claim 18 states that some packets return to the originating node. Perlman does not show that.

Claim 11

Claim 11 was rejected as obvious, based on Crawley and Perlman. However, claim 11(c) recites steps taken "**after** all nodes have received the message." Those steps relate to termination of propagation of the message. (The messages of Applicant's invention continue to propagate, or circulate, even after all nodes have received them. Certain mechanisms operate to eventually extinguish the propagating messages.)

Neither reference propagates messages "**after all nodes** have received the message," or at least such has not been shown in the references. (Presumably, in the references, a message terminates when it reaches its destination.) Thus, neither reference shows the recited post-receipt termination of propagation. One reason is that no propagation exists, after all nodes received the message.

Thus, even if the references are combined, claim 11(c) is not found. The post-receipt steps are absent from both references.

Further, as a matter of logic, no teaching can exist for combining elements which do not exist in references.

Added dependent claim 19 states that some packets return to the originating node. Neither reference shows that.

Claim 1

Claim 1 recites messages which are "self-propagating" and

"self-terminating." Definitions of those terms were given in the Specification.

MPEP § 2106(II)(C) states:

> Where an explicit definition is provided by the applicant for a term, that definition will control interpretation of the term as it is used in the claim.

MPEP § 2111 states:

> PTO applies to verbiage of the proposed claims the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, **taking into account whatever enlightenment by way of definitions OR OTHERWISE that may be afforded by the written description contained in applicant's specification.**

Those types of messages have not been shown in the references.

It could be argued that an ordinary e-mail message is self-propagating (because it reaches its destination) and self-terminating (because it stops when it gets there). However, that argument fails to give meaning to the terms "self-propagating" and "self-terminating."

That is, the term "e-mail message" refers to a message which has the properties of (1) reaching its destination and (2) stopping when it gets there.

But a "self-propagating e-mail message" or a "self-terminating

e-mail message" must refer to an e-mail message having properties in addition to those two properties. The additional properties are defined in the Specification.

This applies to the "self-terminating messages" and "self-propagating" messages of the claims. Ordinary messages (1) get to their destinations and (2) stop when they get there. "Self-terminating messages" and "self-propagating" messages of the claims have additional properties.

The terms must be given the definitions stated in the Specification.

Added dependent claim 16 states that some packets return to the originating node. Neither reference shows that.

Claim 5

Claim 5 recites:

> . . .
>
> b) propagating the reports to all nodes in the network;
>
> c) at some nodes, replacing the propagating reports, by new reports;
>
> d) propagating the new reports to all nodes in the network; . . .

An example of processes covered by claim 5(c) is given in the Specification, page 22. For example, if a "stale" report reaches the node which originated it, then the originating node replaces

the stale report with a new report.

The term "propagating" must be given a meaning which makes sense, and is consistent with the Specification. The Specification speaks of propagating, wherein a node receives a report, and then relays, or propagates, it to other nodes, **AND** the process continues, even after all nodes receive the report. The Specification, page 14, in discussing Rule 5(A), indicates that "propagating" is synonymous with "flooding." The Specification, page 22, states:

> If a node originates an RSP, and then receiving nodes copy it and **propagate** it, flooding would continue forever, because no node would ever discard the RSP. Eternal flooding is not desired, and eventual termination is sought.

"Propagating" clearly means that, when a message, or report, is received, a copy is kept (if needed) and passed on. Added claim 20 emphasizes this, in part.

The PTO purports to find part of claim 5 in Perlman, wherein the PTO asserts that a change in status of a link causes a node to generate a new report and transmit the new report. Presumably, a previous report on that link is being treated as the "propagating" report in claim 5.

However, this overlooks the term "replacing" in claim 5(c). The language clearly means that the "replacing" step causes the

propagating report to terminate at the replacing node. That has not been shown in Perlman.

Restated, claim 5 recites "replacing" a "propagating" report. At best, Perlman shows replacement of a previous report stored in a recipient-node. Such a report is not a "propagating" report.

In addition, the PTO's reading overlooks the specific language of claim 5. Two reports are recited: (1) a "new" report and (2) the "propagating" report, which necessarily **precedes** the "new" report.

Claim 5(b) states that all nodes receive the "propagating" report. The PTO's hypothetical reading of Perlman does not show that. That is, there is no requirement in the PTO's scenario that all nodes previously received a report of the status of the link, before that status of the link changes and the change is reported.

Not all points made in this Summary are repeated below.

Added dependent claim 17 states that some packets return to the originating node. Neither reference shows that.

END SUMMARY

RESPONSE TO REJECTION OF CLAIMS 6 - 10

Claims 6 - 10 were rejected on grounds of anticipation, based on Perlman.

Claim 6

Claim 6 recites:

> 6. A method of operating a packet-switched network, comprising the following steps:
>
> a) at an originating node,
>
> i) generating a message which reports a change in status of a link;
>
> ii) transmitting the message to the neighbors of the originating node;
>
> b) at each neighbor,
>
> i) storing the message if the neighbor does not know of the change; and
>
> ii) transmitting the message to neighbors of the neighbor.

Applicant is unable to locate claim 6(b)(ii) in Perlman, and requests, under 37 CFR §§ 1.104(c)(2) and 35 U.S.C. § 132, that the PTO specifically identify this element. Applicant points out that MPEP § 2131 states:

> A claim is anticipated only if **each and every element** as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.

In this connection, Applicant points out that Perlman appears to operate in a completely different manner than does Applicant's

invention, and thus it makes sense that claim 6(b)(ii) is absent from Perlman.

Perlman states that, in his network, each node determines

1) the links which are connected to it,

2) the state (ie, operative or not) of each link, and

3) the identity of the node at the other end of each link.

Each node prepares a Link State Packet, LSP, which contains this information. Perlman states that each node transmits the LSP to all other nodes in the network. When a node detects that the state of one of its links changes, it transmits a new LSP to all the other nodes. (Column 1, lines 31 - 43.)

But the precise mode of transmitting these LSPs is not clear, at least not to the undersigned attorney. It is submitted that, in Perlman's system, if a network contains 100 nodes, each node

1) generates an LSP,

2) creates 99 copies,

3) addresses one copy to each of the other 99 nodes, and

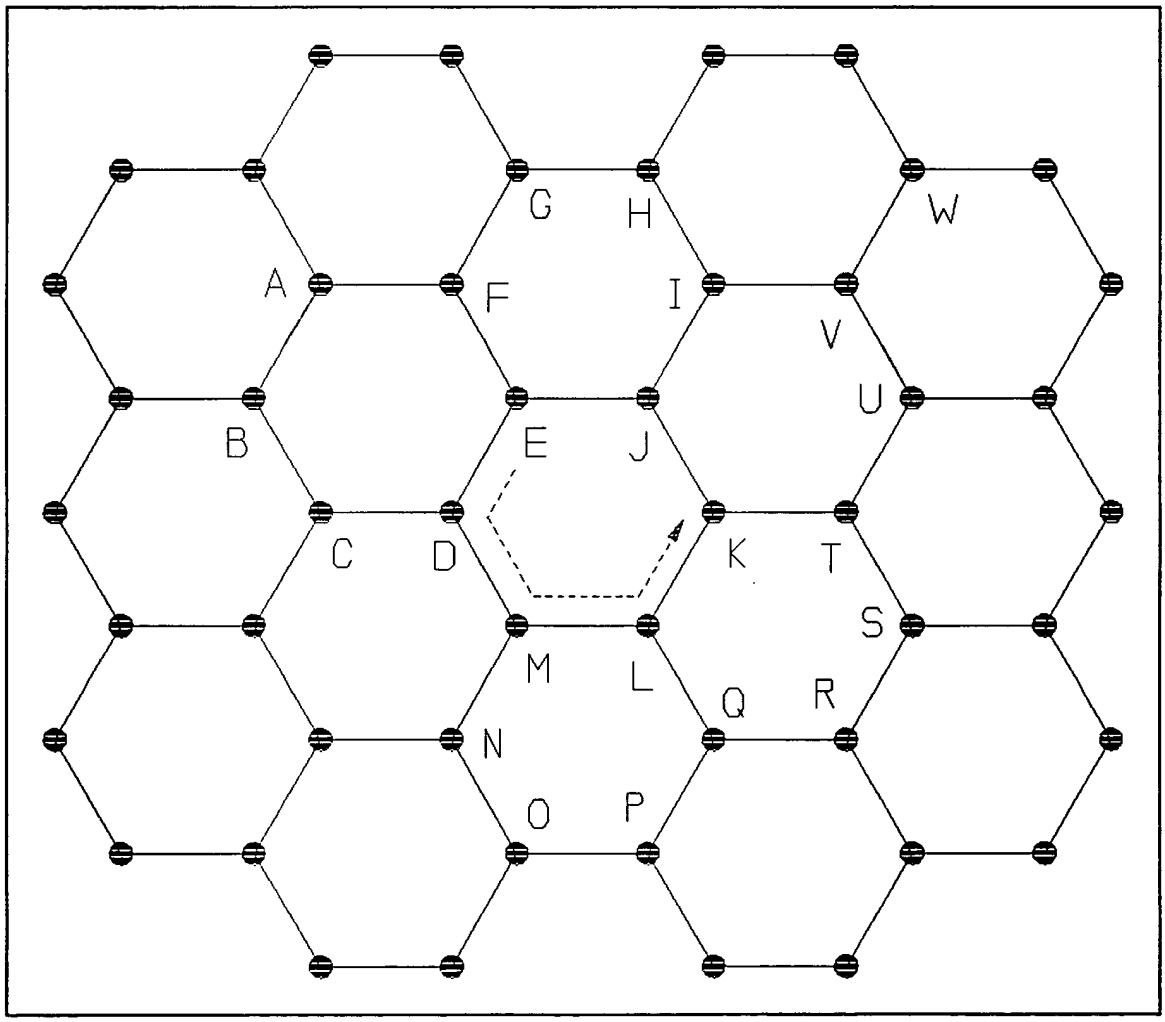
4) sends the LSPs, like e-mail.

That does not show claim 6.

Claim 6(b) states that each neighbor transmits **the message** [of claim 6(a)] to neighbors of that neighbor. Perlman does not show

that, as an example will illustrate.

Sketch 1, repeated below, illustrates a network. Some nodes are labeled.



Sketch 1

Assume that node E is the originating node of Perlman's LSP. That LSP may reach node K via the route indicated by the dashed arrow. Thus, even though node J is a neighbor of node E, node J does not relay the LSP to node K. Claim 6(b) is absent.

In the general case, the route taken by the packet to node K depends on the routing protocol which Perlman utilizes.

Further, Applicant points out that, under claim 6, both nodes J and L send copies of the message to node K. (Claim 6(b) states that **EACH** neighbor transmits the message to its neighbors.) The invention deliberately introduces this redundancy, for reasons explained in the Specification. Perlman does not show that.

Therefore, Applicant submits that claim 6(b) has not been shown in Perlman.

Further, claim 6 must be read as-a-whole. Claim 6(a) states that a node generates a message, and transmits it to the neighbors of the node. That may be included in Perlman, wherein a node transmits an LSP to every other node (99 nodes in the example given above). Since **every** other node receives the message, one would think that all neighbors of that node also received the message.

However, again, claim 6 must be read as-a-whole. Claim 6(b) states that each neighbor transmits **the message** to neighbors of that neighbor. If claim 6(a) is read on the process of Perlman in the manner just done, then claim 6(b) is absent. The reason is that all the nodes received the message in the original

transmission of the 99 messages. Claim 6(b) is absent.

THEREFORE,

-- Claim 6(b) has not been shown in Perlman.

-- Claim 6(b) necessarily recites a redundancy: if a node has two neighbors, it receives two copies of the message. Perlman does not show that.

-- As Sketch 1 indicates, Perlman does not necessarily operate as claim 6(b) recites.

In addition, added claim 19 states that some propagating packets return to the node originating them. Perlman does not show that. As explained above: all his packets stop at their intended destinations, like e-mail messages.

Claim 7

Claim 7 recites:

> 7. Method according to claim 6, wherein the neighbors do not transmit acknowledgement of receipt of the message.

Perlman states that routers in a LAN do not send messages acknowledging receipt of LSPs. However, Perlman states that he transmits a CSNP, Complete Sequence Number Packet, which is a list of all LSPs previously transmitted. (Column 8, lines 41 - 45.) A receiving node looks at the CSNP and determines what LSPs it

should have. If an LSP is missing, the router requests a copy. (Column 9, lines 49 - 53.)

Applicant submits that this request of a copy in Perlman is the equivalent of an acknowledgement. When the sender receives the request, it knows that the LSP was not received.

Perhaps a better equivalent is found at another location in Perlman. Perlman states that a router may possess an LSP which is not listed in the CSNP. If so, the router may send a copy of that LSP to the party originating the CSNP. (Column 10, lines 5 - 18.)

Applicant submits that this is clearly an equivalent of an acknowledgement. In effect, the receiving router is telling the sender, "I received this. Don't you know that ?" That is an acknowledgement.

THEREFORE, Perlman states that acknowledgements are not sent, but gives examples of clear equivalents of acknowledgements. So Perlman teaches **both** the presence of, and the absence of, acknowledgements.

Thus, if Perlman is to show claim 7, it must be on the basis of obviousness. In that case, a teaching must be given in favor of selecting his lack-of-acknowledgement scenario.

Claim 8

Claim 8 recites:

> 8. Method according to claim 6, wherein the message is assigned an age, and the neighbor of paragraph (b) decrements the age, prior to transmission to the neighbor's neighbors.

Applicant cannot find this in Perlman, and requests that it be identified.

The Office Action asserts that the sequence number in Perlman qualifies as the age. However, the mere presence of an age-indicator is not recited in claim 8. Claim 8 states that the neighbor decrements the age. That has not been shown in Perlman.

The Office Action cites column 5, line 63 - column 6, line 6 as showing the decrementing. The undersigned attorney has carefully examined that passage, and can find no discussion of decrementing the sequence number.

This applies to claim 9

Claim 10 is considered patentable, based on parent claim 6.

RESPONSE TO OBVIOUSNESS REJECTIONS

Claims 1 - 5, 11, and 12 were rejected as obvious, based on Perlman and Crawley.

Claim 1 states that the messages are "self-propagating." One definition of "self-propagating" is given in the Specification, page 26, "Additional Consideration" number 2. That definition is this:

> A "self-propagating" message is one which lacks a stated destination, and which is flooded, as described above, when received by a node. In contrast, an ordinary message contains a destination address, and its travel terminates when it reaches the address.

Added claim 15 recites this, in part.

Perlman is cited to show self-propagating messages. However, his LSPs are clearly each addressed to a respective recipient node. Further, he does not "flood" his LSPs.

In addition, claim 1 states that the messages are "self-terminating." One definition of "self-terminating" is given in the Specification, page 27, "Additional Consideration" number 2. That definition is this:

> The RSPs are "self-terminating" because the decision to terminate, while made by a node, is based on information contained within the RSP.

From another perspective, Perlman clearly indicates that a node which originates an LSP sends a copy to every other node. That is not "propagation." When each LSP reaches its destination, it stops there.

Claim 3

Claim 3, speaking generally, states that if a node detects

that the status quo of a link has existed for a time T2, then it floods the network with news of the status at T2. Applicant points out that the link in question is one attached to the node.

Perlman, column 3, lines 31 - 56, is cited to show this. That passage is highly confusing. However, that passage, and its context, appear to state the following.

PERLMAN PASSAGE

> The status of links connecting to a "given node" are discussed. (Lines 29 - 31.) A packet regarding that status is sent to a "first node." The first node attempts to derive the status from the packet, and uses the statuses derived. (Lines 31 - 36.)
>
> If the status of all the links connecting to the given node are derived, then certain stored information is updated. (Lines 39 - 43.)
>
> This process is repeated at a "second node." (Lines 43 - 56.)

Plainly, none of the cited passage in Perlman shows claim 3. No time interval is mentioned in the passage.

Claim 5

Claim 5 recites:

> 5. A method of operating a packet-switched network, comprising the following steps:
>
> a) generating reports of status of links in the network;
>
> b) propagating the reports to all nodes in the network;
>
> c) at some nodes, replacing the propagating reports, by new reports;
>
> d) propagating the new reports to all nodes in the network; and
>
> e) repeating steps (c) and (d).

An example of 5(c) and (d) is found in the Specification, page 22 et seq., in the section entitled "**Selected Properties of a Network Which Follows the Rules**, Termination of Flooding."

One example of termination is given where a packet of age zero is nevertheless propagated. However, when that packet reaches its originating node, the node replaces it with a new packet, which is then flooded.

The Office Action purports to find this action in Perlman, column 4, lines 3 - 19. However, that passage merely refers to generating a packet if status of a link changes. It does not discuss "**replacing** the propagating reports, by new reports," as in claim 5.

The Office Action asserts that, in Perlman, when a link changes, a "replacement packet" is generated. However, that is not correct, nor does it show the parts of claim 5 in question.

One reason is that the PTO is **presuming** that packets are propagating in Perlman when that link changes. That is, a "propagating" packet may indicate that link A is operating properly. The packet may supposedly propagate for minutes or hours. If that packet reaches a node, and simultaneously link A becomes inoperative, then, according to the Office Action, that node would replace the packet with a new one.

The problem with all this is that Perlman does not discuss that type of operation. He sends out LSPs to destinations. The propagation delay is nearly instantaneous, like e-mail on the Internet. The packets are not deliberately caused to bounce around for extended periods, as under the invention. At least, that has not been shown in Perlman.

Thus, the PTO's proposed scenario, wherein (1) a node receives a packet which describes status of a link, (2) the status changes, and (3) the node replaces the packet with a new packet which correctly describes the status, does not occur.

The Office Action finds claim 5(e) in Crawley. However, no valid teaching has been given for combining the references. The rationale given is that the combination provides "continuous update" of link failures.

However, the goal of obtaining "continuous update" does not actually lead to the **combination** of references. Crawley, **by himself**, provides that goal.

Further, the rationale does not follow the CAFC's decision of In re Dembiczak, 175 F. 3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999).

In brief, Dembiczak states that

-- **objective evidence** of a teaching for combining references must be provided;

-- the Examiner's speculation does not qualify as objective evidence;

-- numerous sources can provide a teaching to combine references;

-- knowledge of one skilled in the art can act as a source;

-- however, THE RANGE OF SOURCES AVAILABLE DOES NOT DIMINISH THE REQUIREMENT FOR ACTUAL EVIDENCE;

-- broad conclusory statements by the Examiner do not qualify as evidence; and

-- "particular factual findings" as to the teaching are required, and gives reasons why **facts** are necessary.

No "actual evidence" has been provided, and the PTO's rationale is clearly a "broad conclusory statement."

Claim 11

Applicant points out that, necessarily, claim 11(a)(ii) must occur prior to 11(b). One reason is that the latter refers to "the message." "The message" is that of claim 11(a)(ii).

Applicant cannot find that sequence of operation in Perlman, and requests that it be identified. In this connection, Applicant again points out that Perlman appears to send out all his messages from a node at once. No reason has been advanced by the PTO as to why those messages should be distributed first to the neighbors of the originating node, who then supposedly "propagate" the messages.

Further, the PTO relies on Crawley to show claim 11(c). However, claim 11(c) recites steps which are taken "**AFTER all nodes have received the message**." In Applicant's invention, one example of those steps would be the steps which extinguish propagating messages. An originator destroys a message originated by it, when the message returns.

Perlman has no reason to take such steps because, as explained above, Perlman's messages stop when they reach their destinations. Thus, there is no reason to take post-destination steps. Consequently, there is no reason to combine Crawley with Perlman.

In addition, the same comment applies to Crawley. Crawley discusses "broadcasting" the messages in question. (Figure 4.) That plainly means that a message, like an e-mail message, is

addressed and sent to every recipient. There is no reason for him to take post-destination steps.

Therefore, even if Crawley is combined with Perlman, claim 11(c) is not attained. Neither reference discusses post-arrival steps.

Conclusion

Applicant requests that the rejections to the claims be reconsidered and withdrawn.

Applicant expresses thanks to the Examiner for the careful consideration given to this case.

Respectfully submitted,

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